CPC COOPERATIVE PATENT CLASSIFICATION

G10H   **ELECTROPHONIC MUSICAL INSTRUMENTS** (electronic circuits in general H03)

NOTE

> This subclass covers musical instruments in which individual notes are constituted as electric oscillations under the control of a performer and the oscillations are converted to sound-vibrations by a loud-speaker or equivalent instrument.

G10H 1/00   **Details of electrophonic musical instruments** (keyboards applicable also to other musical instruments G10B, G10C; arrangements for producing a reverberation or echo sound G10K 15/08)

G10H 1/0008   . {Associated control or indicating means (teaching of music per se G09B 15/00)}

G10H 1/0016   . . {Means for indicating which keys, frets or strings are to be actuated, e.g. using lights or leds}

G10H 1/0025   . . {Automatic or semi-automatic music composition, e.g. producing random music, applying rules from music theory or modifying a musical piece (automatically producing a series of tones G10H 1/26)}

G10H 1/0033   . {Recording/reproducing or transmission of music for electrophonic musical instruments (of accompaniment G10H 1/361)}

G10H 1/0041   . . {in coded form (see also G10H 7/002)}

G10H 1/005   . . . {on magnetic tape}

G10H 1/0058   . . . {Transmission between separate instruments or between individual components of a musical system (G10H 1/0083 takes precedence)}

G10H 1/0066   . . . . {using a MIDI interface}

G10H 1/0075   . . . . . {with translation or conversion means for unvailable commands, e.g. special tone colors}

G10H 1/0083   . . {using wireless transmission, e.g. radio, light, infrared}

G10H 1/0091   . {Means for obtaining special acoustic effects (combined with modulation G10H 1/043)}

G10H 1/02   . Means for controlling the tone frequencies, e.g. attack, decay; Means for producing special musical effects, e.g. vibrato, glissando {(for instruments using voltage controlled oscillators and amplifiers or voltage controlled oscillators and filters G10H 5/002)}

G10H 1/04   . . by additional modulation

G10H 1/043   . . . Continuous modulation

G10H 1/045   . . . . by electromechanical means

G10H 1/047   . . . . by acousto-mechanical means, e.g. rotating speakers or sound deflectors

G10H 1/053   . . . during execution only {(voice controlled instruments G10H 5/005)}

G10H 1/0535   . . . . {by switches incorporating a mechanical vibrator, the envelope of the

mechanical vibration being used as modulating signal}

G10H 1/055	. . . .	by switches with variable impedance elements
G10H 1/0551	. . . . .	{using variable capacitors}
G10H 1/0553	. . . . .	{using optical or light-responsive means}
G10H 1/0555	. . . . .	{using magnetic or electromagnetic means}
G10H 1/0556	. . . . .	{using piezo-electric means}
G10H 1/0558	. . . . .	{using variable resistors}
G10H 1/057	. . . .	by envelope-forming circuits
G10H 1/0575	. . . . .	{using a data store from which the envelope is synthesized (tones synthesized from a data store G10H 7/00)}
G10H 1/06	. .	Circuits for establishing the harmonic content of tones, { or other arrangements for changing the tone colour}
G10H 1/08	. . .	by combining tones (G10H 1/14, G10H 1/16 take precedence; chord G10H 1/38; analysis or synthesis of sound waves per se G10L)
G10H 1/10	. . . .	for obtaining chorus, celeste or ensemble effects (continuous modulation G10H 1/043)
G10H 1/12	. . .	by filtering complex waveforms (G10H 1/14, G10H 1/16 take precedence)
G10H 1/125	. . . .	{using a digital filter (digital filters per se H03H 17/02)}
G10H 1/14	. . .	during execution (modulation during execution G10H 1/053; { voice controlled instruments G10H 5/005})
G10H 1/16	. . .	by non-linear elements (G10H 1/14 takes precedence; generation of non-sinusoidal basic tones G10H 5/10)
G10H 1/18	.	Selecting circuits
G10H 1/181	. .	{Suppression of switching-noise}
G10H 1/182	. .	{Key multiplexing (G10H 1/185 takes precedence)}
G10H 1/183	. .	{Channel-assigning means for polyphonic instruments}
G10H 1/185	. . .	{associated with key multiplexing}
G10H 1/186	. . . .	{Microprocessor-controlled keyboard and assigning means}
G10H 1/187	. . .	{using multiplexed channel processors (G10H 1/186 takes precedence)}
G10H 1/188	. . .	{with means to assign more than one channel to any single key}
G10H 1/20	. .	for transposition
G10H 1/22	. .	for suppressing tones; Preference networks
G10H 1/24	. .	for selecting plural preset register stops
G10H 1/26	. .	for automatically producing a series of tones (musical toys A63H 5/00)
G10H 1/28	. . .	to produce arpeggios
G10H 1/30	. . .	to reiteratively sound two tones
G10H 1/32	.	Constructional details
G10H 1/34	. .	Switch arrangements, e.g. keyboards or mechanical switches peculiar to electrophonic musical instruments ({G10H 1/055 takes precedence}; keyboards applicable also to other musical instruments G10B, G10C)
G10H 1/342	. . .	{for guitar-like instruments with or without strings and with a neck on which switches or string-fret contacts are used to detect the notes being played (electric guitars in which the tones are generated by the vibration of strings G10H 3/18)}

G10H 1/344	. . .	{Structural association with individual keys (electrically operated wind-actuated organs G10B 3/22)}
G10H 1/346	. . . .	{ Keys with an arrangement for simulating the feeling of a piano key, e.g. using counterweights, springs, cams}
G10H 1/348	. . . .	{Switches actuated by parts of the body other than the fingers (pedals or pedal mechanisms for wind-actuated organs G10B 3/14, for pianos G10C 3/26)}
G10H 1/36	.	Accompaniment arrangements
G10H 1/361	. .	{Recording/reproducing of accompaniment for use with an external source, e.g. karaoke systems}
G10H 1/363	. . .	{using optical disks, e.g. CD, CD-ROM, to store accompaniment information in digital form (recording/reproducing by optical means G11B 7/00)}
G10H 1/365	. . .	{the accompaniment information being stored on a host computer and transmitted to a reproducing terminal by means of a network, e.g. public telephone lines}
G10H 1/366	. . .	{with means for modifying or correcting the external signal, e.g. pitch correction, reverberation, changing a singer`s voice}
G10H 1/368	. . .	{displaying animated or moving pictures synchronized with the music or audio part}
G10H 1/38	. .	Chord
G10H 1/383	. . .	{ Chord detection and/or recognition, e.g. for correction, or automatic bass generation}
G10H 1/386	. . .	{One-finger or one-key chord systems}
G10H 1/40	. .	Rhythm (metronomes G04F 5/02)
G10H 1/42	. . .	comprising tone forming circuits
G10H 1/44	.	Tuning means
G10H 1/46	.	Volume control
G10H 3/00		**Instruments in which the tones are generated by electromechanical means**
G10H 3/02	.	using mechanical interrupters
G10H 3/03	.	using pick-up means for reading recorded waves, e.g. on rotating discs {drums, tapes or wires}
G10H 3/06	. .	using photoelectric pick-up means
G10H 3/08	. .	using inductive pick-up means
G10H 3/09	. . .	using tapes or wires
G10H 3/10	. .	using capacitative pick-up means
G10H 3/12	.	using mechanical resonant generators, e.g. strings or percussive instruments, the tones of which are picked up by electromechanical transducers, the electrical signals being further manipulated or amplified and subsequently converted to sound by a loudspeaker or equivalent instrument
G10H 3/125	. .	{Extracting or recognising the pitch or fundamental frequency of the picked up signal}
G10H 3/14	. .	using mechanically actuated vibrators with pick-up means (G10H 3/24 takes

precedence)

G10H 3/143	. . .	{characterised by the use of a piezo-electric or magneto-strictive transducer (piezo-electric or magnetostrictive loudspeakers for mechanical vibrations B06B, G10K; piezo-electric or magneto-strictive transducers or microphones H04R 15/00, H04R 17/00)}
G10H 3/146	. . .	{using a membrane, e.g. a drum; Pick-up means for vibrating surfaces, e.g. housing of an instrument}
G10H 3/16	. . .	using a reed
G10H 3/18	. . .	using a string, e.g. electric guitar {mechanical features G10D 1/085}
G10H 3/181	. . . .	{Details of pick-up assemblies}
G10H 3/182	. . . .	{using two or more pick-up means for each string}
G10H 3/183	. . . .	{in which the position of the pick-up means is adjustable}
G10H 3/185	. . . .	{in which the tones are picked up through the bridge structure}
G10H 3/186	. . . .	{Means for processing the signal picked up from the strings (filtering G10H 1/12)}
G10H 3/187	. . . . .	{for distorting the signal, e.g. to simulate tube amplifiers (changing the tone color by non-linear elements G10H 1/16)}
G10H 3/188	. . . . .	{for converting the signal to digital format (transmission using a MIDI interface G10H 1/0066)}
G10H 3/20	. . .	using a tuning fork, rod or tube
G10H 3/22	. .	using electromechanically actuated vibrators with pick-up means (G10H 3/24 takes precedence)
G10H 3/24	. .	incorporating feed-back means, e.g. acoustic
G10H 3/26	. . .	using electric feed-back

G10H 5/00		**Instruments in which the tones are generated by means of electronic generators** (G10H 7/00 takes precedence)
G10H 5/002	.	{Instruments using voltage controlled oscillators and amplifiers or voltage controlled oscillators and filters, e.g. Synthesisers}
G10H 5/005	.	{Voice controlled instruments}
G10H 5/007	.	{Real-time simulation of G10B, G10C, G10D-type instruments using recursive or non-linear techniques, e.g. waveguide networks, recursive algorithms (establishing the harmonic content of tones by non-linear elements G10H 1/16; synthesising waveforms using a recursive algorithm G10H 7/12)}
G10H 5/02	.	using generation of basic tones
G10H 5/04	. .	with semiconductor devices as active elements (G10H 3/10, G10H 3/12 take precedence)
G10H 5/06	. .	tones generated by frequency multiplication or division of a basic tone
G10H 5/07	. . .	resulting in complex waveforms
G10H 5/08	. .	tones generated by heterodyning
G10H 5/10	.	using generation of non-sinusoidal basic tones, e.g. saw-tooth {G10H 5/06 takes precedence}
G10H 5/12	. .	using semiconductor devices as active elements

G10H 5/14	.	using electromechanical resonator, e.g. quartz crystal, as frequency determining element {G10H 5/02, G10H 5/08 take precedence}
G10H 5/16	.	using cathode ray tube

G10H 7/00		**Instruments in which the tones are synthesised from a data store, e.g. computer organs** (synthesis of acoustic waves not specific to musical instruments G10K 15/02, G10L)
G10H 7/002	.	{using a common processing for different operations or calculations, and a set of micro-instructions (programme) to control the sequence thereof}
G10H 7/004	. .	{with one or more auxiliary processor in addition to the main processing unit}
G10H 7/006	. .	{using two or more algorithms of different types to generate tones, e.g. according to tone color or to processor workload}
G10H 7/008	.	{Means for controlling the transition from one tone waveform to another (glissando or legato per se G10H 1/02)}
G10H 7/02	.	in which amplitudes at successive sample points of a tone waveform are stored in one or more memories
G10H 7/04	. .	in which amplitudes are read at varying rates, e.g. according to pitch
G10H 7/045	. . .	{using an auxiliary register or set of registers, e.g. a shift-register, in which the amplitudes are transferred before being read}
G10H 7/06	. .	in which amplitudes are read at a fixed rate, the read-out address varying stepwise by a given value, e.g. according to pitch
G10H 7/08	.	by calculating functions or polynomial approximations to evaluate amplitudes at successive sample points of a tone waveform
G10H 7/10	. .	using coefficients or parameters stored in a memory, e.g. Fourier coefficients (G10H 7/12 takes precedence)
G10H 7/105	. . .	{using Fourier coefficients}
G10H 7/12	. .	by means of a recursive algorithm using one or more sets of parameters stored in a memory and the calculated amplitudes of one or more preceding sample points

G10H 2210/00		**Aspects or methods of musical processing having intrinsic musical character, i.e. involving musical theory or musical parameters or relying on musical knowledge, as applied in electrophonic musical tools or instruments** (processing aspects without intrinsic musical character G10H 2250/00)
G10H 2210/005	.	Musical accompaniment, i.e. complete instrumental rhythm synthesis added to a performed melody, e.g. as output by drum machines (background music G10H 2210/021)
G10H 2210/011	. .	Fill-in added to normal accompaniment pattern
G10H 2210/015	. .	Accompaniment break, i.e. interrupting then restarting
G10H 2210/021	.	Background music, e.g. for video sequences, elevator music (musical accompaniment G10H 2210/005)

G10H 2210/026	. .	for games, e.g. videogames
G10H 2210/031	.	Musical analysis, i.e. isolation, extraction or identification of musical elements or musical parameters from a raw acoustic signal or from an encoded audio signal (neural networks for electrophonic musical instruments or musical processing G10H 2250/311)
G10H 2210/036	. .	of musical genre, i.e. analysing the style of musical pieces, usually for selection, filtering or classification
G10H 2210/041	. .	based on mfcc [mel -frequency spectral coefficients]
G10H 2210/046	. .	for differentiation between music and non-music signals, based on the identification of musical parameters, e.g. based on tempo detection
G10H 2210/051	. .	for extraction or detection of onsets of musical sounds or notes i.e. note attack timings
G10H 2210/056	. .	for extraction or identification of individual instrumental parts, e.g. melody, chords, bass; Identification or separation of instrumental parts by their characteristic voices or timbres
G10H 2210/061	. .	for extraction of musical phrases, isolation of musically relevant segments, e.g. musical thumbnail generation, or for temporal structure analysis of a musical piece, e.g. determination of the movement sequence of a musical work
G10H 2210/066	. .	for pitch analysis as part of wider processing for musical purposes, e.g. transcription, musical performance evaluation; Pitch recognition, e.g. in polyphonic sounds; Estimation or use of missing fundamental
G10H 2210/071	. .	for rhythm pattern analysis or rhythm style recognition (rhythm pattern per se G10H 2210/341)
G10H 2210/076	. .	for extraction of timing, tempo; Beat detection (tempo display G10H 2220/081; tempo control G10H 2210/375)
G10H 2210/081	. .	for automatic key or tonality recognition, e.g. using musical rules or a knowledge base
G10H 2210/086	. .	for transcription of raw audio or music data to a displayed or printed staff representation or to displayable MIDI-like note-oriented data, e.g. in pianoroll format
G10H 2210/091	. .	for performance evaluation, i.e. judging, grading or scoring the musical qualities or faithfulness of a performance, e.g. with respect to pitch, tempo or other timings of a reference performance
G10H 2210/095	.	Inter-note articulation aspects, e.g. legato or staccato
G10H 2210/101	.	Music Composition or musical creation; Tools or processes therefor
G10H 2210/105	. .	Composing aid, e.g. for supporting creation, edition or modification of a piece of music
G10H 2210/111	. .	Automatic composing, i.e. using predefined musical rules
G10H 2210/115	. . .	using a random process to generate a musical note, phrase, sequence or structure (using a random process to build a rhythm pattern G10H 2210/356; random rhythm pattern selection G10H 2210/366)
G10H 2210/121	. . . .	using a knowledge base
G10H 2210/125	. .	Medley, i.e. linking parts of different musical pieces in one single piece, e.g. sound collage, DJ mix
G10H 2210/131	. .	Morphing, i.e. transformation of a musical piece into a new different one, e.g. remix
G10H 2210/136	. . .	Morphing interpolation, i.e. interpolating in pitch, harmony or time, tempo or rhythm, between two different musical pieces, e.g. to produce a new musical work

G10H 2210/141	. .	Riff, i.e. improvisation, e.g. repeated motif or phrase, automatically added to a piece, e.g. in real time
G10H 2210/145	. .	Composing rules, e.g. harmonic or musical rules, for use in automatic composition; Rule generation algorithms therefor
G10H 2210/151	. .	using templates, i.e. incomplete musical sections, as a basis for composing
G10H 2210/155	.	Musical effects
G10H 2210/161	. .	Note sequence effects, i.e. sensing, altering, controlling, processing or synthesising a note trigger selection or sequence, e.g. by altering trigger timing, triggered note values, adding improvisation or ornaments, also rapid repetition of the same note onset, e.g. on a piano, guitar, e.g. rasgueado, drum roll (smooth variations of amplitude, pitch or timbre within a note without distinct onsets, e.g. vibrato G10H 2210/201)
G10H 2210/165	. . .	Humanizing effects, i.e. causing a performance to sound less machine-like, e.g. by slightly randomising pitch or tempo
G10H 2210/171	. . .	Ad-lib effects, i.e. adding a musical phrase or improvisation automatically or on player's request, e.g. one-finger triggering of a note sequence
G10H 2210/175	. . .	Fillnote, i.e. adding isolated notes or passing notes to the melody
G10H 2210/181	. . .	Gracenote, i.e. adding a different and very short ornamental note at the beginning or at the end of a melody note, e.g. appoggiatura, acciaccatura, sparsh-swar.
G10H 2210/185	. . .	Arpeggio, i.e. notes played or sung in rapid sequence, one after the other, rather than ringing out simultaneously, e.g. as a chord; Generators therefor, i.e. arpeggiators; Discrete glissando effects on instruments not permitting continuous glissando, e.g. xylophone or piano, with stepwise pitch variation and on which distinct onsets due to successive note triggerings can be heard
G10H 2210/191	. . .	Tremolo, tremulando, trill or mordent effects, i.e. repeatedly alternating stepwise in pitch between two note pitches or chords, without any portamento between the two notes (other common forms of tremolo, e.g. same note repetition, bisbigliando, amplitude tremolo, tremulants, percussion roll G10H 2210/161 or G10H 2210/205)
G10H 2210/195	. .	Modulation effects, i.e. smooth non-discontinuous variations over a time interval, e.g. within a note, melody or musical transition, of any sound parameter, e.g. amplitude, pitch, spectral response, playback speed (stepwise or discontinuous variations over time, e.g. sequence effects G10H 2210/161)
G10H 2210/201	. . .	Vibrato, i.e. rapid, repetitive and smooth variation of amplitude, pitch or timbre within a note or chord (discontinuities, note sequences or separate note onsets during the variation G10H 2210/161; tremolo, i.e. stepwise pitch alternation G10H 2210/191)
G10H 2210/205	. . . .	Amplitude vibrato, i.e. repetitive smooth loudness variation without pitch change or rapid repetition of the same note, bisbigliando, amplitude tremolo, tremulants (percussion roll G10H 2210/161)
G10H 2210/211	. . . .	Pitch vibrato, i.e. repetitive and smooth variation in pitch, e.g. as obtainable with a whammy bar or tremolo arm on a guitar (non-repetitive smooth pitch variation, e.g. glissando G10H 2220/221; repeatedly alternating stepwise in pitch between two notes G10H 2210/191)
G10H 2210/215	. . . .	Rotating vibrato, i.e. simulating rotating speakers, e.g. Leslie effect
G10H 2210/221	. . .	Glissando, i.e. pitch smoothly sliding from one note to another, e.g. gliss, glide, slide, bend , smear, sweep; ("discrete glissando" on instruments not permitting continuous glissando, like the xylophone or the piano, e.g. arpeggio S10H 210/186)
G10H 2210/225	. . . .	Portamento, i.e. smooth continuously variable pitch-bend, without emphasis of each chromatic pitch during the pitch change, which only stops at the end

of the pitch shift, as obtained e.g. by a MIDI pitch wheel or trombone (pitch bend with emphasis of each chromatic pitch during pitch change, e.g. glissando, G10H 2210/221)

G10H 2210/231	. . .	Wah-wah spectral modulation, i.e. tone color spectral glide obtained by sweeping the peak of a bandpass filter up or down in frequency, e.g. according to the position of a pedal, by automatic modulation or by voice formant detection; control devices therefor, e.g. wah pedals for electric guitars
G10H 2210/235	. . .	Flanging or phasing effects, i.e. creating time and frequency dependent constructive and destructive interferences, obtained e.g. by using swept comb filters or a feedback loop around all-pass filters with gradually changing non-linear phase response or delays
G10H 2210/241	. . .	Scratch effects, i.e. emulating playback velocity or pitch manipulation effects normally obtained by a disc-jockey manually rotating a LP record forward and backward
G10H 2210/245	. .	Ensemble, i.e. adding one or more voices, also instrumental voices
G10H 2210/251	. . .	Chorus, i.e. automatic generation of two or more extra voices added to the melody, e.g. by a chorus effect processor or multiple voice harmonizer, to produce a chorus or unison effect, wherein individual sounds from multiple sources with roughly the same timbre converge and are perceived as one
G10H 2210/255	. . . .	Unison, i.e. two or more voices or instruments sounding substantially the same pitch, e.g. at the same time
G10H 2210/261	. . .	Duet, i.e. automatic generation of a second voice, descant or counter melody, e.g. of a second harmonically interdependent voice by a single voice harmonizer or automatic composition algorithm, e.g. for fugue, canon or round composition, which may be substantially independent in contour and rhythm
G10H 2210/265	. .	Acoustic effect simulation, i.e. volume, spatial, resonance or reverberation effects added to a musical sound, usually by appropriate filtering or delays (physical modeling of room acoustics G10H 2250/531; formant synthesis G10H 2250/481)
G10H 2210/271	. . .	Sympathetic resonance, i.e. adding harmonics simulating sympathetic resonance from other strings
G10H 2210/275	. . . .	Helmholtz resonance effect, i.e. using, exciting or emulating air resonance in a cavity
G10H 2210/281	. . .	Reverberation or echo
G10H 2210/285	. . . .	Electromechanical effectors therefor, i.e. using springs or similar electromechanical audio delay units
G10H 2210/291	. . . .	Reverberator using both direct, i.e. dry, and indirect i.e. wet, signals or waveforms, indirect signals having sustained one or more virtual reflections
G10H 2210/295	. . .	Spatial effects, musical uses of multiple audio channels, e.g. stereo (Helmholtz resonance effects G10H 2210/275; reverberation or echo G10H 2210/281)
G10H 2210/301	. . . .	Soundscape or sound field simulation, reproduction or control for musical purposes, e.g. surround or 3D sound; Granular synthesis
G10H 2210/305	. . . .	Source positioning in a soundscape, e.g. instrument positioning on a virtual soundstage, stereo panning or related delay or reverberation changes; Changing the stereo width of a musical source
G10H 2210/311	. .	Distortion, i.e. desired non-linear audio processing to change the tone color, e.g. by adding harmonics or deliberately distorting the amplitude of an audio waveform (distortion functions G10H 2250/201, G10H 2250/205)
G10H 2210/315	. .	Dynamic effects for musical purposes, i.e. musical sound effects controlled by the amplitude of the time domain audio envelope, e.g. loudness-dependent tone color or musically desired dynamic range compression or expansion (crossfading or envelope processing per se G10H 2250/025)
G10H 2210/321	. .	Missing fundamental, i.e. creating the psychoacoustic impression of a missing

fundamental tone through synthesis of higher harmonics, e.g. to play bass notes pitched below the frequency range of reproducing speakers

G10H 2210/325	.	Musical pitch modification (pitch analysis **S10H 210/065**; musical effects G10H 2210/155)
G10H 2210/331	. .	Note pitch correction, i.e. modifying a note pitch or replacing it by the closest one in a given scale
G10H 2210/335	. . .	Chord correction, i.e. modifying one or several notes within a chord, e.g. to correct wrong fingering or to improve harmony (natural chords **S10H 210/585**)
G10H 2210/341	.	Rhythm pattern selection, synthesis or composition (Rhythm analysis G10H 2210/071; accompaniment G10H 2210/005)
G10H 2210/346	. .	Pattern variations, break or fill-in (accompaniment G10H 2210/005)
G10H 2210/351	. .	Inserting a drum roll, e.g. as pattern break
G10H 2210/356	. .	Random process used to build a rhythm pattern
G10H 2210/361	. .	Selection among a set of pre-established rhythm patterns
G10H 2210/366	. .	Random process affecting a selection among a set of pre-established patterns
G10H 2210/371	. .	Rhythm syncopation, i.e. timing offset of rhythmic stresses or accents, e.g. note extended from weak to strong beat or started before strong beat
G10H 2210/375	.	Tempo or beat alterations; Music timing control (tempo display G10H 2220/081; tempo analysis G10H 2210/076; humanising effect G10H 2210/165; scratch effect G10H 2210/241)
G10H 2210/381	. .	Manual tempo setting or adjustment (tempo setting by interpretation of conducting movements G10H 2220/206)
G10H 2210/385	. .	Speed change, i.e. variations from preestablished tempo, tempo change e.g. faster or slower, accelerando or ritardando, without change in pitch (with repetitive changes in pitch, e.g. scratch DJ effects G10H 2210/241)
G10H 2210/391	. .	Automatic tempo adjustment, correction or control
G10H 2210/395	.	Special musical scales, i.e. other than the 12- interval equally tempered scale; Special input devices therefor (keyboards G10H 2220/221)
G10H 2210/401	. .	Microtonal scale; i.e. continuous scale of pitches, also interval-free input devices, e.g. continuous keyboards for violin, singing voice or trombone synthesis
G10H 2210/405	. .	Honkytonk scale, for producing e.g. a honky-tonk piano effect, i.e. with deliberately detuned notes within each octave
G10H 2210/411	. .	Railsback scale, i.e. stretched scale for piano tuning with bass keys having lower pitches and treble keys having higher pitches than foreseen by the equally tempered scale.
G10H 2210/415	. .	Equally tempered scale, i.e. note tuning scale in which every pair of adjacent notes has an identical frequency ratio equal to 2 to the power 1/n if the scale has n notes per octave
G10H 2210/421	. . .	10 equal intervals per octave
G10H 2210/425	. . .	19 equal intervals per octave, offering better major thirds, far better minor thirds and overall far greater consonance than normal 12-semitone equal temperament, at the cost of a flatter fifth
G10H 2210/431	. . .	Quarter tone scale, i.e. 24 equal intervals per octave, e.g. for Arabic music (other Arabic scales, double harmonic scale or major locrian scale G10H 2210/511)
G10H 2210/435	. . .	Huygens scale, i.e. 31 equal intervals per octave, provides near-just major

thirds, and provides decent matches for harmonics up to at least 13, despite a slightly less accurate fifth than the standard 12 interval equally tempered scale

G10H 2210/441	. . .	Janko scale, i.e. 41 equal intervals per octave, e.g. as used in the "tonal plexus" keyboard with 211 keys per octave arranged in 12 staggered columns, i.e. in 41 regions of 5 keys each plus 6 duplicate enharmonic keys (janko keyboards, i.e. not using the janko scale G10H 2220/251)
G10H 2210/445	. . .	45 equal intervals per octave
G10H 2210/451	. . .	Holder scale or Holdrian comma, i.e. 53 equal intervals per octave, with 31 intervals equal to an almost just perfect fifth; Keyboards therefor, e.g. "generalized keyboard" of Robert Holford Macdowall Bosanquet
G10H 2210/455	. . .	70 equal intervals per octave
G10H 2210/461	. . .	Jankovski scale or twelfth tone scale, i.e. octave divided in 72 equal intervals, e.g. moria in Byzantine music theory (janko keyboard G10H 2220/251)
G10H 2210/465	. . .	84 equal intervals per octave
G10H 2210/471	. .	Natural or just intonation scales, i.e. based on harmonics consonance such that most adjacent pitches are related by harmonically pure ratios of small integers (pitch correction only when playing chords to ensure chord consonance G10H 2210/586)
G10H 2210/476	. . .	Zarlino scales, e.g. octave subdivision based on the pitch ratios 9/8 + 10/9 + 16/15 + 9/8 + 10/9 + 9/8 + 16/15
G10H 2210/481	. . .	Pythagorean scale, i.e. in which the frequency relationships of all intervals should be based on the perfect fifth, with ratio 3:2
G10H 2210/486	. . .	Werckmeister scales, i.e. family of scales with 12 mostly rational intervals, e.g. for organs
G10H 2210/491	. . .	Meantone scales, i.e. in which all non-octave intervals are generated from a stack of tempered perfect fifths; and wherein, by choosing an appropriate size for major and minor thirds, the syntonic comma is tempered to unison, e.g. quarter comma meantone, syntonic comma, d'Alembert modified meantone
G10H 2210/496	. . .	Redfield scales, i.e. 12 intervals per octave, based on note ratios equal to $(2^{**}p)^*(3^{**}q)^*(5^{**}r)$ with p,q, r positive or negative integers
G10H 2210/501	. . .	Altered natural scale, i.e. 12 unequal intervals not foreseen in the above
G10H 2210/506	. . .	Danielou 53 interval scale, with note ratios equal to $(2^{**}p)(3^{**}q)(5^{**}r)$, with p,q,r positive or negative integers (53 interval equally tempered Holder scale G10H 2210/451)
G10H 2210/511	. .	Arabic scales, i.e. either double harmonic scale or major locrian scale; vosta or zaid modes (17 or 24 equal interval scales used in arabic music G10H 2210/415 or G10H 2210/431)
G10H 2210/515	. .	Balinese scales, e.g. for gamelan, with instruments played in pairs and tuned slightly apart to produce interference beating ideally at a consistent speed for all pairs of notes in all registers; Balinese pentatonic scales, e.g. Balinese slendr? scale, or five-tone modes of the heptatonic pelog scale, itself substantially a 7-note subset of 9-tone equal temperament (pentatonic javanese slendr? scale G10H 2210/541)
G10H 2210/521	. .	Polynesian scales
G10H 2210/525	. .	Diatonic scales, e.g. aeolian, ionian or major, dorian, locrian, lydian, mixolydian, phrygian, i.e. seven note, octave-repeating musical scales comprising five whole steps and two half steps for each octave, in which the two half steps are separated from each other by either two or three whole steps
G10H 2210/531	. .	Bluenote scale, i.e. 7-tone scale of 2+1+2+1+3+1+2 semitones (hexatonic blues scales G10H 2210/535)
G10H 2210/535	. .	Hexatonal or hexatonic scales, i.e. six pitches or notes per octave, e.g. whole tone

scale, augmented scale, Prometheus scale, blues scale

G10H 2210/541	. .	Pentatonal or pentatonic scale, i.e. five pitches or notes per octave, e.g. basic chinese musical scale, black piano keys, javanese gamelan slendr? scale, japanese shakuhachi flute (balinese pentatonic scales with deliberate interference beating, e.g. balinese gamelan slendr? scale G10H 2210/515)
G10H 2210/545	. . .	Yona Nuki , i.e. a family of pentatonic scales without fourth or seventh, e.g. Hirajoshi, Iwato, Kumoi, Sino-indian [Raga Amritavarsini] used e.g. for japanese traditional music, koto or shamisen tunings
G10H 2210/551	. . .	Okinawa pentatonic scale, i.e. Okinawan min'yo e.g. including the half-steps omitted in the min'yo pentatonic scale used in the main japanese islands
G10H 2210/555	.	Tonality processing, involving the key in which a musical piece or melody is played (tonality analysis, detection or identification G10H 2210/081)
G10H 2210/561	. .	Changing the tonality within a musical piece
G10H 2210/565	. .	Manual designation or selection of a tonality
G10H 2210/571	.	Chords; Chord sequences (special keyboards for playing chords, e.g. accordion G10H 2230/245, janko keyboard G10H 2220/251)
G10H 2210/576	. .	Chord progression
G10H 2210/581	. .	Chord inversion
G10H 2210/586	. .	Natural chords, i.e. adjustment of individual note pitches in order to generate just intonation chords (scale natural G10H 2210/471; chord correction G10H 2210/335; musical analysis G10H 2210/031)
G10H 2210/591	. .	Chord with a suspended note, e.g. 2nd or 4th
G10H 2210/596	. .	Chord augmented
G10H 2210/601	. .	Chord diminished
G10H 2210/606	. .	Chord ninth, i.e. including ninth or above, e.g. 11th or 13th
G10H 2210/611	. .	Chord ninth or above, to which is added a tension note
G10H 2210/616	. .	Chord seventh, major or minor
G10H 2210/621	. .	Chord seventh dominant
G10H 2210/626	. .	Chord sixth

G10H 2220/00	**Input/output interfacing specifically adapted for electrophonic musical tools or instruments**

G10H 2220/005	.	Non-interactive screen display of musical or status data (graphical user interfaces specifically adapted for electrophonic musical instruments G10H 2220/091; fingering displays G10H 2220/041)
G10H 2220/011	. .	Lyrics displays, e.g. for karaoke applications
G10H 2220/015	. .	Musical staff, tablature or score displays, e.g. for score reading during a performance. (graphical musical score editing G10H 2220/121; musical score displays resulting from a transcription G10H 2210/086)
G10H 2220/021	.	Indicator, i.e. non-screen output user interfacing, e.g. visual or tactile instrument status or guidance information using lights, LEDs, seven segments displays (screen displays G10H 2220/005, graphical user interfaces adapted for electrophonic musical instruments G10H 2220/091; tactile key feedback G10H 2220/311)

G10H 2220/026	. .	associated with a key or other user input device, e.g. key indicator lights
G10H 2220/031	. . .	Blinking or flashing indicator lights
G10H 2220/036	. . .	Chord indicators, e.g. displaying note fingering when several notes are to be played simultaneously as a chord
G10H 2220/041	. . .	Remote key fingering indicator, i.e. fingering shown on a display separate from the instrument itself or substantially disjoint from the keys.
G10H 2220/046	. . .	Drumpad indicator, e.g. drumbeat strike indicator light on a drumpad or rim
G10H 2220/051	. . .	Fret indicator, e.g. for playing guidance on a string instrument or string instrument emulator
G10H 2220/056	. . .	Hand or finger indicator, e.g. for indicating which hand or which specific finger should be used
G10H 2220/061	. . .	LED, i.e. using a light-emitting diode as indicator
G10H 2220/066	. . . .	Colour, i.e. indications with two or more different colours
G10H 2220/071	. . .	Pedal indicator, e.g. guitar pedal status lights
G10H 2220/076	. . .	String indicator, e.g. on a stringed musical instrument for indicating which string is to be played, plucked or bowed
G10H 2220/081	. .	Beat indicator, e.g. marks or flashing LEDs to indicate tempo or beat positions (analysis tempo G10H 2210/076; tempo or beat alterations G10H 2210/375; rhythm pattern G10H 2210/341)
G10H 2220/086	. .	Beats per minute [bpm] indicator, i.e. displaying a tempo value, e.g. in words or as numerical value in beats per minute (analysis tempo G10H 2210/076; tempo or beat alterations G10H 2210/375)
G10H 2220/091	.	Graphical user interface [GUI] specifically adapted for electrophonic musical instruments, e.g. interactive musical displays, musical instrument icons or menus; Details of user interactions therewith (GUI in general G06F 3/048)
G10H 2220/096	. .	using a touch screen (touch screen note input, e.g. using a displayed keyboard G10H 2220/241; personal digital assistant [PDA] G10H 2230/015)
G10H 2220/101	. .	for graphical creation, edition or control of musical data or parameters
G10H 2220/106	. . .	using icons, e.g. selecting, moving or linking icons, on-screen symbols, screen regions or segments representing musical elements or parameters
G10H 2220/111	. . . .	for graphical orchestra or soundstage control, e.g. on-screen selection or positioning of instruments in a virtual orchestra, using movable or selectable musical instrument icons (soundstage sound field effects G10H 2210/305)
G10H 2220/116	. . .	for graphical editing of sound parameters or waveforms, e.g. by graphical interactive control of timbre, partials or envelope (non-graphical waveform editing G10H 2250/615)
G10H 2220/121	. . .	for graphical editing of a musical score, staff or tablature (mere score display G10H 2220/015; score transcription G10H 2210/086)
G10H 2220/126	. . .	for graphical editing of individual notes, parts or phrases represented as variable length segments on a 2D or 3D representation, e.g. graphical edition of musical collage, remix files or pianoroll representations of MIDI-like files.
G10H 2220/131	. . .	for abstract geometric visualisation of music, e.g. for interactive editing of musical parameters linked to abstract geometric figures
G10H 2220/135	.	Musical aspects of games or videogames; Musical instrument-shaped game input interfaces (game background music G10H 2210/026; musical game scoring or performance evaluation G10H 2210/091)
G10H 2220/141	. .	Games on or about music, i.e. based on musical knowledge, e.g. musical multimedia quizzes (teaching of music per se G09B 15/00)

G10H 2220/145	. .	Multiplayer musical games, e.g. karaoke-like multiplayer videogames
G10H 2220/151	. .	Musical difficulty level setting or selection
G10H 2220/155	.	User input interfaces for electrophonic musical instruments (graphical user interfaces specifically adapted for electrophonic musical instruments G10H 2220/091; input means in general G06F 3/00)
G10H 2220/161	. .	with 2D or x/y surface coordinates sensing (graphical user interface or touchscreen input G10H 2220/091; microtonal keyboard G10H 2210/401)
G10H 2220/165	. .	for string input, i.e. special characteristics in string composition or use for sensing purposes, e.g. causing the string to become its own sensor (transducers, e.g. piezoelectric or magnetic G10H 2220/461; plectrum sensors G10H 2220/191; guitar neck sensors or fret switches G10H 2220/301)
G10H 2220/171	. . .	using electrified strings, e.g. strings carrying coded or AC signals for transducing, sustain, fret length or fingering detection
G10H 2220/175	. . .	using nonmagnetic string materials, e.g. nylon; Sensors specially adapted therefor (piezoelectric transducers G10H 2220/525)
G10H 2220/181	. . .	by nonresonant wave interaction, i.e. string sensing using wavelengths unrelated to string resonant wavelengths, e.g. ultrasonic waves, microwave or light waves, propagated along a musical instrument string to measure its fret length, e.g. for MIDI transcription
G10H 2220/185	. .	Stick input, e.g. drumsticks with position or contact sensors (stick for music conducting applications, e.g. conductor baton movement detection G10H 2220/206)
G10H 2220/191	. .	Plectrum or pick sensing, e.g. for detection of string striking or plucking. (Plectra in general, e.g. for stringed musical instruments G10D 3/163)
G10H 2220/195	. .	Particle energy or molecular configuration used as musical control data
G10H 2220/201	. .	for movement interpretation, i.e. capturing and recognizing a gesture or a specific kind of movement e.g. to control a musical instrument
G10H 2220/206	. . .	Conductor baton movement detection used to adjust rhythm, tempo or expressivity of e.g. the playback of musical pieces
G10H 2220/211	. .	for microphones, i.e. control of musical parameters either directly from microphone signals or by physically associated peripherals, e.g. karaoke control switches or rhythm sensing accelerometer within the microphone casing (microphones per se H04R)
G10H 2220/215	. .	using a magnetic strip on a card or sheet
G10H 2220/221	. .	Keyboards, i.e. configuration of several keys or key-like input devices relative to one another (details of individual keys or key-like devices G10H 2220/265; continuous keyboards or keyboards implementing specific musical scales, e.g. quartertone G10H 2210/395; switch matrix keyboards, e.g. on guitar necks G10H 2220/295)
G10H 2220/226	. . .	Whole-tone keyboards, i.e. having as many keys on the upper row as on the lower row
G10H 2220/231	. . .	Alphanumeric, used for musical purposes or with additional musical features, e.g. typewriter or pc-type keyboard reconfigured such that letters or symbols are assigned to musical notes
G10H 2220/236	. . .	representing an active musical staff or tablature, i.e. with key-like position sensing at the expected note positions on the staff (active keyboard representation on a touchscreen G10H 2220/241)
G10H 2220/241	. . .	on touchscreens, i.e. keys, frets, strings, tablature or staff displayed on a touchscreen display for note input purposes
G10H 2220/246	. . .	with reduced number of keys per octave, some notes missing

G10H 2220/251	. . .	arranged as 2D or 3D arrays; Keyboards ergonomically organised for playing chords or for transposing, e.g. Janko keyboard (special keyboards for playing chords, e.g. accordion G10H 2230/245)
G10H 2220/256	. . .	foldable or rollable, e.g. for transport
G10H 2220/261	. . .	Numeric keypad used for musical purposes, e.g. musical input via a telephone or calculator-like keyboard
G10H 2220/265	. .	Key design details; Special characteristics of individual keys of a keyboard; Key-like musical input devices, e.g. finger sensors, pedals, potentiometers, selectors (keyboards G10H 2220/221, special musical scales G10H 2210/395)
G10H 2220/271	. . .	Velocity sensing for individual keys, e.g. by placing sensors at different points along the kinematic path for individual key velocity estimation by delay measurement between adjacent sensor signals (velocity sensing common to several keys G10H 2220/221)
G10H 2220/275	. . .	Switching mechanism or sensor details of individual keys, e.g. details of key contacts, hall effect or piezoelectric sensors used for key position or movement sensing purposes; Mounting thereof
G10H 2220/281	. . . .	with two contacts, switches or sensor triggering levels along the key kinematic path
G10H 2220/285	. . . .	with three contacts, switches or sensor triggering levels along the key kinematic path
G10H 2220/291	. . . .	with four or more contacts, switches or sensor triggering levels along the key kinematic path
G10H 2220/295	. . . .	Switch matrix, e.g. contact array common to several keys, the actuated keys being identified by the rows and columns in contact
G10H 2220/301	. . . . .	Fret-like switch array arrangements for guitar necks
G10H 2220/305	. . .	using a light beam to detect key, pedal or note actuation (light beams in general G10H 2220/411)
G10H 2220/311	. . .	with controlled tactile or haptic feedback effect; output interfaces therefor
G10H 2220/315	. .	for joystick-like proportional control of musical input; Videogame input devices used for musical input or control, e.g. gamepad, joysticks (joysticks per se G06F 3/033, G05G 9/047, A63F 13/06)
G10H 2220/321	. .	Garment sensors, i.e. musical control means with trigger surfaces or joint angle sensors, worn as a garment by the player e.g. bracelet, intelligent clothing (vital parameter sensing G10H 2220/371; wearable interfaces in general G06F3)
G10H 2220/326	. . .	Control glove or other hand or palm-attached control device
G10H 2220/331	. . .	Ring or other finger-attached control device
G10H 2220/336	. . .	Control shoe or boot, i.e. sensor-equipped lower part of lower limb, e.g. shoe, toe ring, sock, ankle bracelet or leg control attachment (garment sensors G10H 2220/321; floor sensing devices, e.g. sensing mats G10H 2220/341)
G10H 2220/341	. .	Floor sensors, e.g. platform or groundsheet with sensors to detect foot position, balance or pressure, steps, stepping rhythm, dancing movements or jumping (shoe sensors G10H 2220/336)
G10H 2220/346	. . .	Hopscotch sensing mats, i.e. including several step sensing zones, e.g. for detection of rhythmic dancing in time to background music according to stepping indications (games involving music G10H 2220/135; performance evaluation or scoring G10H 2210/091, videogames in general A63F13)
G10H 2220/351	. .	Environmental parameters, e.g. temperature, ambient light, atmospheric pressure, humidity, used as input for musical purposes
G10H 2220/355	. . .	Geolocation input, i.e. control of musical parameters based on location or geographic position, e.g. provided by GPS, WiFi network location databases or mobile phone base station position databases

G10H 2220/361	. .	Mouth control in general, i.e. breath, mouth, teeth, tongue or lip-controlled input devices or sensors detecting e.g. lip position, lip vibration, air pressure, air velocity, air flow or air jet angle
G10H 2220/365	. .	Bow control in general, i.e. sensors or transducers on a bow; Input interface or controlling process for emulating a bow, bowing action or generating bowing parameters, e.g. for appropriately controlling a specialised sound synthesiser (bowed string instrument sound synthesis per se G10H 2250/445; electrophonic stringed instrument details G10H 2230/075)
G10H 2220/371	. .	Vital parameter control, i.e. musical instrument control based on body signals e.g. brainwaves, pulsation, temperature, perspiration; biometric information (signals from body positions or movements G10H 2220/321)
G10H 2220/376	. . .	using brain waves, e.g. EEG
G10H 2220/381	. . .	using glottal signals from an electroglottograph [EGG] or from a neck-worn glottis pick-up device
G10H 2220/386	. . .	using genetic information [DNA] or unique characterizing features of individuals, e.g. fingerprints, iris, facial or vocal features
G10H 2220/391	. .	Angle sensing for musical purposes, using data from a gyroscope, gyrometer or other angular velocity or angular movement sensing device (angles measured by an accelerometer or gravimeter G10H 2220/395; angles calculated from 3D position sensing G10H 2220/401; player body joint angle sensing G10H 2220/321)
G10H 2220/395	. .	Acceleration sensing or accelerometer use, e.g. 3D movement computation by integration of accelerometer data, angle sensing with respect to the vertical, i.e. gravity sensing. (conductor baton movement sensing G10H 2220/206, angle sensing without reference to gravity G10H 2220/391; player body joint angle sensing G10H 2220/321)
G10H 2220/401	. .	3D sensing, i.e. three-dimensional (x, y, z) position or movement sensing. (movement pattern or gesture sensing G10H 2220/201; geolocation sensing G10H 2220/355, 3D sensing with accelerometer G10H 2220/395)
G10H 2220/405	. .	Beam sensing or control, i.e. input interfaces involving substantially immaterial beams, radiation, or fields of any nature, used e.g. as a switch as in a light barrier, or as a control device, e.g. using the theremin electric field sensing principle (theremins G10H 2230/051)
G10H 2220/411	. . .	Light beams (key actuation detection using light G10H 2220/305)
G10H 2220/415	. . . .	Infrared beams
G10H 2220/421	. . . .	Laser beams
G10H 2220/425	. . .	Radio control, i.e. input or control device involving a radio frequency signal
G10H 2220/431	. . . .	Use of microwaves
G10H 2220/435	. . .	Ultrasound, i.e. input or control device involving inaudible pressure waves, e.g. focused as a beam
G10H 2220/441	. .	Image sensing, i.e. capturing images or optical patterns for musical purposes or musical control purposes (image analysis, inspection, positioning or tracking G06T 7/00, pattern recognition G06K 9/00)
G10H 2220/445	. . .	Bar codes or similar machine readable optical code patterns, e.g. two dimensional mesh pattern, for musical input or control purposes (bar codes G06K 7/10)
G10H 2220/451	. . .	Scanner input, e.g. scanning a paper document such as a musical score for automated conversion into a musical file format
G10H 2220/455	. . .	Camera input, e.g. analyzing pictures from a video camera and using the analysis results as control data
G10H 2220/461	.	Transducers, i.e. details, positioning or use of assemblies to detect and convert

mechanical vibrations or mechanical strains into an electrical signal, e.g. audio, trigger or control signal (contact microphones for use on musical instrument H04R 1/46)

G10H 2220/465	. .	Bridge-positioned, i.e. assembled to or attached with the bridge of a stringed musical instrument
G10H 2220/471	. . .	at bottom, i.e. transducer positioned at the bottom of the bridge, between the bridge and the body of the instrument
G10H 2220/475	. . .	on the side, i.e. picking up vibrations from a side of the bridge
G10H 2220/481	. . .	on top, i.e. transducer positioned between the strings and the bridge structure itself
G10H 2220/485	. . .	One transducer per string, e.g. 6 transducers for a 6 string guitar
G10H 2220/491	. . .	Two or more transducers per string, e.g. 8 transducers on a 4-string violin bridge
G10H 2220/495	. . .	Single bridge transducer, common to all strings
G10H 2220/501	. . .	Two or more bridge transducers, at least one transducer common to several strings
G10H 2220/505	. .	Dual coil electrodynamic string transducer, e.g. for humbucking, to cancel out parasitic magnetic fields
G10H 2220/511	. . .	Stacked, i.e. one coil on top of the other
G10H 2220/515	. . .	Staggered, i.e. two coils side by side
G10H 2220/521	. .	Hall effect transducers or similar magnetic field sensing semiconductor devices, e.g. for string vibration sensing or key movement sensing
G10H 2220/525	. .	Piezoelectric transducers for vibration sensing or vibration excitation in the audio range; Piezoelectric strain sensing, e.g. as key velocity sensor; Piezoelectric actuators, e.g. key actuation in response to a control voltage
G10H 2220/531	. . .	made of piezoelectric film
G10H 2220/535	. . . .	Piezoelectric polymer transducers, e.g. made of stretched and poled polyvinylidene difluoride [PVDF] sheets in which the molecular chains of vinylidene fluoride CH_2-CF_2 have been oriented in a preferential direction
G10H 2220/541	. . .	using piezoceramics, e.g. lead titanate [$PbTiO_3$], zinc oxide [$Zn_2 O_3$], lithium niobate [$LiNbO_3$], sodium tungstate [$NaWO_3$], bismuth ferrite [$BiFeO_3$]
G10H 2220/545	. . . .	Barium titanate piezoceramics [$BaTiO_3$]
G10H 2220/551	. . . .	using LZT or PZT [lead-zirconate-titanate] piezoceramics [$Pb[Zr_xTi_{1-x}]O_3$, $0=x=1$]
G10H 2220/555	. . .	Bimorph transducers, i.e. piezoelectric bending multilayer structures with one or more piezoelectric layers e.g. piezo on metal, serial bimorph or parallel bimorph
G10H 2220/561	. .	Piezoresistive transducers, i.e. exhibiting vibration, pressure, force or movement-dependent resistance, e.g. strain gauges, carbon-doped elastomers or polymers for piezoresistive drumpads, carbon microphones
G10H 2220/565	. .	Shielding, electromagnetic or magnetic, e.g. for transducers, i.e. for controlling, orienting or suppressing magnetic fields or for preventing unintentional generation, propagation and reception of electromagnetic energy in electrophonic musical instruments, their vicinity or their interconnections (dual coil humbucking transducers G10H 2220/505)

G10H 2230/00   **General physical, ergonomic or hardware implementation of electrophonic musical tools or instruments, e.g. shape or architecture**

| G10H 2230/005 | . | Device type or category |

G10H 2230/011	. .	Hybrid piano, e.g. combined acoustic and electronic piano with complete hammer mechanism as well as key-action sensors coupled to an electronic sound generator
G10H 2230/015	. .	PDA [personal digital assistant] or palmtop computing devices used for musical purposes, e.g. portable music players, tablet computers, e-readers or smart phones in which mobile telephony functions need not be used (touch-screen interfaces G10H 2220/096)
G10H 2230/021	. .	Mobile ringtone, i.e. generation, transmission, conversion or downloading of ringing tones or other sounds for mobile telephony; Special musical data formats or protocols herefor (mobile telephone transmission specifically adapted for electrophonic musical tools or instruments G10H 2240/251)
G10H 2230/025	.	Computing or signal processing architecture features
G10H 2230/031	. .	Use of cache memory for electrophonic musical instrument processes e.g. for improving processing capabilities or solving interfacing problems
G10H 2230/035	. .	Power management, i.e. specific power supply solutions for electrophonic musical instruments, e.g. auto power shut-off, energy saving designs, power conditioning, connector design, avoiding inconvenient wiring
G10H 2230/041	. .	Processor load management, i.e. adaptation or optimization of computational load or data throughput in computationally intensive musical processes to avoid overload artifacts, e.g. by deliberately suppressing less audible or less relevant tones or decreasing their complexity
G10H 2230/045	.	Special instrument [spint], i.e. mimicking the ergonomy, shape, sound or other characteristic of a specific acoustic musical instrument category
G10H 2230/051	. .	Spint theremin, i.e. mimicking electrophonic musical instruments in which tones are controlled or triggered in a touch-free manner by interaction with beams, jets or fields, e.g. theremin, air guitar, water jet controlled musical instrument i.e. hydrolauphone
G10H 2230/055	. .	Spint toy, i.e. specifically designed for children, e.g. adapted for smaller fingers or simplified in some way; Musical instrument-shaped game input interfaces with simplified control features
G10H 2230/061	. .	Spint organ, i.e. mimicking acoustic musical instruments with pipe organ or harmonium features; Electrophonic aspects of acoustic pipe organs or harmoniums; MIDI-like control therefor
G10H 2230/065	. .	Spint piano, i.e. mimicking acoustic musical instruments with piano, cembalo or spinet features, e.g. with piano-like keyboard; Electrophonic aspects of piano-like acoustic keyboard instruments; MIDI-like control therefor
G10H 2230/071	. . .	Spint harpsichord, i.e. mimicking plucked keyboard instruments e.g. harpsichord, virginal, muselar, spinet, clavicytherium, ottavino, archicembalo
G10H 2230/075	. .	Spint stringed, i.e. mimicking stringed instrument features, electrophonic aspects of acoustic stringed musical instruments without keyboard; MIDI-like control therefor (string instrument sound synthesis G10H 2250/441)
G10H 2230/081	. . .	Spint viola
G10H 2230/085	. . .	Spint cello
G10H 2230/091	. . .	Spint hurdygurdy, i.e. mimicking characteristics of acoustic instruments with rosined wheel rubbing against strings
G10H 2230/095	. . .	Spint zither, i.e mimicking any neckless stringed instrument in which the strings do not extend beyond the sounding board
G10H 2230/101	. . . .	Spint koto, i.e. mimicking any traditional asian-style plucked zither with movable bridges
G10H 2230/105	. . . .	Spint dulcimer, i.e. mimicking any zither-like instrument with small hand-played mallet hammers (Appalachian dulcimer G10H 2230/095)

G10H 2230/111	. . .	Spint ukulele, i.e. mimicking any smaller guitar-like flat bridge string instruments
G10H 2230/115	. . .	Spint sitar, i.e. mimicking any long-necked plucked string instrument with a large number of additional non-playable sympathetic resonating strings or an additional gourd-like resonating chamber
G10H 2230/121	. . .	Spint mandolin i.e. mimicking instruments of the lute family with hard sounding board e.g. with strings arranged and tuned in pairs for tremolo playing (lute with skin -like sounding board G10H 2230/151)
G10H 2230/125	. . .	Spint harp, i.e. mimicking harp-like instruments, e.g. large size concert harp, with pedal
G10H 2230/131	. . . .	Spint harp celtic, i.e. mimicking smaller sized harps without pedal, eg. celtic harp, lever harp , folk harp, Irish harp
G10H 2230/135	. . .	Spint guitar, i.e. guitar-like instruments in which the sound is not generated by vibrating strings, e.g. guitar-shaped game interfaces
G10H 2230/141	. . . .	Spint guitar drum, i.e. mimicking a guitar used at least partly as a percussion instrument
G10H 2230/145	. . . .	Spint guitar keyboard, i.e. mimicking a combination of a guitar-like instrument, with or without strings, and a piano-like keyboard, e.g. with white and black keys arranged like on a piano
G10H 2230/151	. . .	Spint banjo, i.e. mimicking a stringed instrument with a piece of plastic or animal skin stretched over a circular frame or gourd, e.g. shamisen or other skin-covered lutes
G10H 2230/155	. .	Spint wind instrument, i.e. mimicking musical wind instrument features; Electrophonic aspects of acoustic wind instruments; MIDI-like control therefor. (wind instrument sound synthesis G10H 2250/461; mouth control, e.g. breath G10H 2220/361; natural aerodynamic noise synthesis, e.g. wind G10H 2250/431)
G10H 2230/161	. . .	Spint whistle, i.e. mimicking wind instruments in which the air is split against an edge, e.g. musical whistles, three tone samba whistle, penny whistle, pea whistle; whistle-emulating mouth interfaces; MIDI control therefor e.g. for calliope
G10H 2230/165	. . . .	Spint recorder, i.e. mimicking any end-blown whistle flute with several finger holes, e.g. recorders, xiao, kaval, shakuhachi and hocchiku flutes
G10H 2230/171	. . .	Spint brass mouthpiece, i.e. mimicking brass-like instruments equipped with a cupped mouthpiece, e.g. allowing it to be played like a brass instrument, with lip controlled sound generation as in an acoustic brass instrument; Embouchure sensor or MIDI interfaces therefor
G10H 2230/175	. . . .	Spint trumpet, i.e. mimicking cylindrical bore brass instruments, e.g. bugle
G10H 2230/181	. . . .	Spint trombone, i.e. mimicking trombones or other slide musical instruments permitting a continuous musical scale (microtonal scale G10H 2210/401)
G10H 2230/185	. . . .	Spint horn, i.e. mimicking conical bore brass instruments (hornpipes G10H 2230/241)
G10H 2230/191	. . . . .	Spint French horn, i.e. mimicking an orchestral horn with valves for switching pipe lengths (English horn G10H 2230/231)
G10H 2230/195	. . .	Spint flute, i.e. mimicking or emulating a transverse flute or air jet sensor arrangement therefor, e.g. sensing angle, lip position, etc, to trigger octave change; (input breath G10H 2220/361; end-blown flutes G10H 2230/161)
G10H 2230/201	. . . .	Spint piccolo, i.e. half-size transverse flute, e.g. ottavino (piccolo clarinet G10H 2230/241)
G10H 2230/205	. . .	Spint reed, i.e. mimicking or emulating reed instruments, sensors or interfaces therefor
G10H 2230/211	. . . .	Spint harmonica, i.e. mimicking mouth operated wind instruments with multiple tuned free reeds, a.k.a. harmonica, blues harp, mouth organ, pitch

		pipe, ChengGong, (free reed instruments not operated by mouth, e.g. accordion G10H 2230/245)
G10H 2230/215	. . . .	Spint bagpipe, i.e. mimicking instruments with enclosed reeds fed from a constant reservoir; Bagpipe-like electrophonic instrument; Midi-like interfaces therefor
G10H 2230/221	. . . .	Spint saxophone, i.e mimicking conical bore musical instruments with single reed mouthpiece, e.g. saxophones, electrophonic emulation or interfacing aspects therefor
G10H 2230/225	. . . .	Spint oboe, i.e. mimicking double reed woodwind with conical bore, e.g. oboe
G10H 2230/231	. . . . .	Spint english horn
G10H 2230/235	. . . .	Spint bassoon, i.e. mimicking double reed low range woodwind with doubled back conical bore, e.g. bassoon
G10H 2230/241	. . . .	Spint clarinet, i.e. mimicking any member of the single reed cylindrical bore woodwind instrument family, e.g. piccolo clarinet, octocontrabass, chalumeau, hornpipes, zhaleika
G10H 2230/245	. .	Spint accordion, i.e. mimicking accordions; Electrophonic instruments with one or more typical accordion features, e.g. special accordion keyboards or bellows, electrophonic aspects of mechanical accordions, Midi-like control therefor
G10H 2230/251	. .	Spint percussion, i.e. mimicking percussion instruments; Electrophonic musical instruments with percussion instrument features; Electrophonic aspects of acoustic percussion instruments, MIDI-like control therefor (gensound percussion G10H 2250/435)
G10H 2230/255	. . .	Spint xylophone, i.e. mimicking any multi-toned percussion instrument with a multiplicity of tuned resonating bodies, regardless of their material or shape, e.g. xylophone, vibraphone, lithophone, metallophone, marimba, balafon, ranat, gamban, anklong
G10H 2230/261	. . .	Spint triangle
G10H 2230/265	. . .	Spint maracas, i.e. mimicking shells or gourds filled with seeds or dried beans, fitted with a handle, e.g. maracas, rumba shakers, shac-shacs
G10H 2230/271	. . .	Spint gong, i.e. mimicking circular flat, nippled or bowl-shaped metallic percussion instruments (G10H 2230/321 takes precedence)
G10H 2230/275	. . .	Spint drum
G10H 2230/281	. . . .	Spint drum assembly, i.e. mimicking two or more drums or drumpads assembled on a common structure, e.g. drum kit (multi-toned percussion instruments G10H 2230/255)
G10H 2230/285	. . . .	Spint drum tomtom, i.e. mimicking side-mounted drums without snares, e.g. in a drumkit
G10H 2230/291	. . . .	Spint drum bass, i.e. mimicking bass drums; Pedals or interfaces therefor
G10H 2230/295	. . . .	Spint drum brush, i.e. mimicking use of a brush to generate or trigger a percussive sound
G10H 2230/301	. . . .	Spint drum rim, i.e. mimicking using or striking the rim of a drum or percussion instrument, rimshot; Interfacing aspects of the generation of different drumsound harmonic contents when a drum sensor is struck closer to the rim
G10H 2230/305	. . . .	Spint drum snare, i.e. mimicking using strands of snares made of curled metal wire, metal cable, plastic cable, or gut cords stretched across the drumhead, e.g. snare drum, side drum, military drum, field drum
G10H 2230/311	. . . .	Spint bongo
G10H 2230/315	. . . .	Spint conga

G10H 2230/321	. . .	Spint cymbal, i.e. mimicking thin center-held gong-like instruments made of copper-based alloys, e.g. ride cymbal, china cymbal, sizzle cymbal, swish cymbal, zill, i.e. finger cymbals
G10H 2230/325	. . . .	Spint cymbal crash, i.e. mimicking thin-edged cymbals designed to produce a loud, sharp "crash", either mounted on a stand and played with a drum stick, e.g. crash cymbal, or played in pairs by hand, e.g. clash cymbals
G10H 2230/331	. . . .	Spint cymbal hihat, e.g. mimicking high-hat cymbal; Details of the pedal interface, of the pedal action emulation or of the generation of the different sounds resulting from this pedal action
G10H 2230/335	. . .	Spint cyldrum [cylindrical body hit or struck on the curved surface for musical purposes, e.g. drinking glass, oil drum]
G10H 2230/341	. . .	Spint claves, i.e. mimicking a pair of thick dowels producing a bright clicking sound when struck against each other
G10H 2230/345	. . .	Spint castanets, i.e. mimicking a joined pair of concave shells held in the hand to produce clicks for rhythmic accents or a ripping or rattling sound consisting of a rapid series of clicks, e.g. castanets, ch?caras, krakebs, qraqib, garagab
G10H 2230/351	. . .	Spint bell, i.e. mimicking bells, e.g. cow-bells (bells in general G10K 1/06)
G10H 2230/355	. .	Spint spint, i.e. electrophonic musical instruments with features of acoustic instruments covered by G10D17, electrophonic aspects of acoustic instruments covered by G10D17, e.g. aeolian harps, MIDI-like control therefor
G10H 2230/361	. .	Spint mechautomatic, i.e. electrophonic musical instruments with features of traditional mechanical automatic acoustic instruments, e.g. electrophonic emulation of historic mechanical pianoroll pianos, electrophonic aspects of partly mechanical automatic acoustic instruments covered by G10F, e.g. hybrid pianos, MIDI-like control therefor
G10H 2230/365	.	Ergonomy of electrophonic musical instruments
G10H 2230/371	. .	Using hook and loop-type fastener or similar attachment to fasten detachable elements

G10H 2240/00		**Data organisation or data communication aspects, specifically adapted for electrophonic musical tools or instruments**
G10H 2240/005	.	Data structures for use in electrophonic musical devices; Data structures including musical parameters derived from musical analysis (audio retrieval G06F 17/3074)
G10H 2240/011	.	Files or data streams containing coded musical information, e.g. for transmission (audio coding G10L 19/00)
G10H 2240/016	. .	File editing, i.e. modifying musical data files or streams as such (editing by means of a graphical user interface G10H 2220/091)
G10H 2240/021	. . .	for MIDI-like files or data streams
G10H 2240/026	. .	File encryption of specific electrophonic music instrument file or stream formats, e.g. MIDI, note oriented formats, sound banks, wavetables (digital rights management [DRM] G06F 21/00; encryption H04L 9/00)
G10H 2240/031	. .	File merging MIDI, i.e. merging or mixing a MIDI-like file or stream with a non-MIDI file or stream, e.g. audio or video
G10H 2240/036	. .	File multilingual, e.g. multilingual lyrics for karaoke
G10H 2240/041	. .	File watermark, i.e. embedding a hidden code in an electrophonic musical instrument file or stream for identification or authentification purposes (audio watermarking **G10L 19/00W**)
G10H 2240/046	. .	File format, i.e. specific or non-standard musical file format used in or adapted for

electrophonic musical instruments, e.g. in wavetables (details of musical waveform synthesis G10H 2250/541)

G10H 2240/051	. . .	AC3, i.e. Audio Codec 3, Dolby Digital
G10H 2240/056	. . .	MIDI or other note-oriented file format
G10H 2240/061	. . .	MP3, i.e. MPEG-1 or MPEG-2 Audio Layer III, lossy audio compression
G10H 2240/066	. . .	MPEG audio-visual compression file formats, e.g. MPEG-4 for coding of audio-visual objects (MP3 G10H 2240/061)
G10H 2240/071	. . .	Wave, i.e. Waveform Audio File Format, coding e.g. uncompressed PCM audio according to the RIFF bitstream format method
G10H 2240/075	.	Musical metadata derived from musical analysis or for use in electrophonic musical instruments (additional information unrelated to its juxtaposed musical file data G10H 2240/091; audio retrieval G06F 17/3074)
G10H 2240/081	. .	Genre classification, i.e. descriptive metadata for classification or selection of musical pieces according to style (analysis genre **S10H 210/035**)
G10H 2240/085	. .	Mood, i.e. generation, detection or selection of a particular emotional content or atmosphere in a musical piece
G10H 2240/091	.	Info, i.e. juxtaposition of unrelated auxiliary information or commercial messages with or between music files (metadata G10H 2240/075)
G10H 2240/095	.	Identification code, e.g. ISWC for musical works; Identification dataset
G10H 2240/101	. .	User identification
G10H 2240/105	. . .	User profile, i.e. data about the user, e.g. for user settings or user preferences
G10H 2240/111	. . .	User Password, i.e. security arrangements to prevent third party unauthorised use, e.g. password, id number, code, pin
G10H 2240/115	. .	Instrument identification, i.e. recognizing an electrophonic musical instrument, e.g. on a network, by means of a code, e.g. IMEI, serial number, or a profile describing its capabilities
G10H 2240/121	.	Musical libraries, i.e. musical databases indexed by musical parameters, wavetables, indexing schemes using musical parameters, musical rule bases or knowledge bases e.g. for automatic composing methods; (audio retrieval G06F 17/3074)
G10H 2240/125	. .	Library distribution, i.e. distributing musical pieces from a central or master library
G10H 2240/131	. .	Library retrieval, i.e. searching a database or selecting a specific musical piece, segment, pattern, rule or parameter set
G10H 2240/135	. . .	Library retrieval index, i.e. using an indexing scheme to efficiently retrieve a music piece
G10H 2240/141	. . .	Library retrieval matching, i.e. any of the steps of matching an inputted segment or phrase with musical database contents, e.g. query by humming, singing or playing; the steps may include e.g. musical analysis of the input, musical feature extraction, query formulation, or details of the retrieval process
G10H 2240/145	. .	Sound library, i.e. involving the specific use of a musical database as a sound bank or wavetable; indexing, interfacing, protocols or processing therefor
G10H 2240/151	. .	Thumbnail, i.e. retrieving, playing or managing a short and musically relevant song preview from a library, e.g. the chorus (thumbnail extraction, analysis phrases G10H 2210/061)
G10H 2240/155	. .	Library update, i.e. making or modifying a musical database using musical parameters as indices (data structures involving musical parameters G10H 2240/005)

G10H 2240/161	.	Memory and use thereof, in electrophonic musical instruments, e.g. memory map (data structures G10H 2240/005; memory cache G10H 2230/031; libraries G10H 2240/121; files G10H 2240/011)
G10H 2240/165	. .	Memory card, i.e. removable module or card for storing music data for an electrophonic musical instrument
G10H 2240/171	.	Transmission of musical instrument data, control or status information; Transmission, remote access or control of music data for electrophonic musical instruments (details about the transmitted data contents G10H 2240/011)
G10H 2240/175	. .	for jam sessions or musical collaboration through a network, e.g. for composition, ensemble playing or repeating; Compensation of network or internet delays therefor
G10H 2240/181	. .	Billing, i.e. purchasing of data contents for use with electrophonic musical instruments; Protocols therefor; Management of transmission or connection time therefor
G10H 2240/185	. .	Error prevention, detection or correction in files or streams for electrophonic musical instruments
G10H 2240/191	. . .	CRC, i.e. error detection using a cyclic redundancy check
G10H 2240/195	. . .	Reed-solomon error detection or correction, i.e. by considering the message symbols as polynomial coefficients
G10H 2240/201	. .	Physical layer or hardware aspects of transmission to or from an electrophonic musical instrument, e.g. voltage levels, bit streams, code words or symbols over a physical link connecting network nodes or instruments
G10H 2240/205	. . .	Synchronous transmission of an analog or digital signal, e.g. according to a specific intrinsic timing, or according to a separate clock
G10H 2240/211	. . .	Wireless transmission, e.g. of music parameters or control data by radio, infrared or ultrasound (beam G10H 2220/405)
G10H 2240/215	. . .	Spread spectrum, i.e. transmission on a bandwidth considerably larger than the frequency content of the original information
G10H 2240/221	. . .	Time division multiplexing, with different channels in different time slots, the data in the time slots may be in digital or analog form
G10H 2240/225	. . .	Frequency division multiplexing
G10H 2240/231	. . .	Quadrature modulation, e.g. QAM
G10H 2240/235	. . .	Pulse amplitude modulation, e.g. quantized or analog
G10H 2240/241	. . .	Telephone transmission, i.e. using twisted pair telephone lines or any type of telephone network
G10H 2240/245	. . . .	ISDN [Integrated Services Digital Network]
G10H 2240/251	. . . .	Mobile telephone transmission, i.e. transmitting, accessing or controlling music data wirelessly via a wireless or mobile telephone receiver, analog or digital, e.g. DECT GSM, UMTS (smartphone, PDA or palmtop used for musical purposes G10H 2230/015; mobile ringtone G10H 2230/021)
G10H 2240/255	. . .	Optical fibre transmission for electrophonic musical instrument purposes, e.g. hum mitigation
G10H 2240/261	. . .	Satellite transmission for musical instrument purposes, e.g. processing for mitigation of satellite transmission delays
G10H 2240/265	. . .	CATV transmission, i.e. electrophonic musical instruments connected to community antennas or cable television networks
G10H 2240/271	. . .	Serial transmission according to any one of RS-232 standards for serial binary single-ended data and control signals between a DTE and a DCE

G10H 2240/275	. . .	Musical interface to a personal computer PCI bus, "peripheral component interconnect bus"
G10H 2240/281	. .	Protocol or standard connector for transmission of analog or digital data to or from an electrophonic musical instrument
G10H 2240/285	. . .	USB, i.e. either using a USB plug as power supply or using the USB protocol to exchange data
G10H 2240/291	. . .	SCSI, i.e. Small Computer System Interface
G10H 2240/295	. . .	Packet switched network, e.g. token ring (circuit-switched networks, e.g. traditional analog telephone transmission G10H 2240/241)
G10H 2240/301	. . . .	Ethernet, e.g. according to IEEE 802.3
G10H 2240/305	. . . .	Internet or TCP/IP protocol use for any electrophonic musical instrument data or musical parameter transmission purposes
G10H 2240/311	. . .	MIDI transmission (G10H 2240/056 takes precedence)
G10H 2240/315	. . .	Firewire, i.e. transmission according to IEEE1394
G10H 2240/321	. . .	Bluetooth
G10H 2240/325	.	Synchronizing two or more audio tracks or files according to musical features or musical timings (synchronised lyrics e.g. for karaoke G10H 2220/011)

G10H 2250/00   **Aspects of algorithms or signal processing methods without intrinsic musical character, yet specifically adapted for or used in electrophonic musical processing** (methods with intrinsic musical character G10H 2210/00)

G10H 2250/005	.	Algorithms for electrophonic musical instruments or musical processing, e.g. for automatic composition or resource allocation (mathematical functions therefor G10H 2250/131; details of musical waveform synthesis G10H 2250/541)
G10H 2250/011	. .	Genetic algorithms, i.e. using computational steps analogous to biological selection, recombination and mutation on an initial population of e.g. sounds, pieces, melodies or loops to compose or otherwise generate e.g. evolutionary music or sound synthesis
G10H 2250/015	. .	Markov chains, e.g. hidden Markov models [HMM], for musical processing, e.g. musical analysis or musical composition
G10H 2250/021	. . .	Dynamic programming, e.g. Viterbi, for finding the most likely or most desirable sequence in music analysis, processing or composition (Viterbi decoding H03M 13/41)
G10H 2250/025	.	Envelope processing of music signals in e.g. time domain, transform domain or cepstrum domain
G10H 2250/031	. .	Spectrum envelope processing
G10H 2250/035	. .	Crossfade, i.e. time domain amplitude envelope control of the transition between musical sounds or melodies, obtained for musical purposes, e.g. for ADSR tone generation, articulations, medley, remix (audio mixers H04H 60/04)
G10H 2250/041	.	Delay lines applied to musical processing (reverberation effects G10H 2210/281; time-delay networks H03H 9/30; chain of active-delay devices H03K 5/132)
G10H 2250/046	. .	with intermediate taps
G10H 2250/051	. .	with variable time delay or variable length
G10H 2250/055	.	Filters for musical processing or musical effects; Filter responses, filter architecture, filter coefficients or control parameters therefor (tone controls H03G 5/00; graphic

equalizers H03G 9/00; digital filters in general H03H 17/00; current or voltage-controlled filters H03H 11/1291)

G10H 2250/061	. .	Allpass filters
G10H 2250/065	. . .	Lattice filter, Zobel network, constant resistance filter or X-section filter, i.e. balanced symmetric all-pass bridge network filter exhibiting constant impedance over frequency
G10H 2250/071	. .	All pole filter, i.e. autoregressive [AR] filter (IIR defined by their temporal impulse response G10H 2250/121)
G10H 2250/075	. .	All zero filter, i.e. moving average [MA] filter or finite impulse response [FIR] filter (FIR defined by their temporal impulse response G10H 2250/115)
G10H 2250/081	. .	Autoregressive moving average [ARMA] filter
G10H 2250/085	. .	Butterworth filters
G10H 2250/091	. .	Chebyshev filters (Chebyshev polynomials G10H 2250/191)
G10H 2250/095	. .	Filter coefficient interpolation
G10H 2250/101	. .	Filter coefficient update; Adaptive filters, i.e. with filter coefficient calculation in real time
G10H 2250/105	. .	Comb filters
G10H 2250/111	. .	Impulse response, i.e. filters defined or specfed by their temporal impulse response features, e.g. for echo or reverberation applications (reverberation effects G10H 2210/281)
G10H 2250/115	. . .	FIR impulse, e.g. for echoes or room acoustics, the shape of the impulse response is specified in particular according to delay times (FIR filters for musical processing G10H 2250/075)
G10H 2250/121	. . .	IIR impulse (all pole filters for musical processing G10H 2250/071)
G10H 2250/125	. .	Notch filters
G10H 2250/131	.	Mathematical functions for musical analysis, processing, synthesis or composition (algorithms for musical processing S10H 250/05; computation of mathematical functions G06F 17/10 and G06F 7/544)
G10H 2250/135	. .	Autocorrelation
G10H 2250/141	. .	Bessel functions, e.g. for smoothing or modulating, for FM audio synthesis or for expressing the vibration modes of a circular drum membrane
G10H 2250/145	. .	Convolution, e.g. of a music input signal with a desired impulse response to compute an output (transforms, i.e. mathematical transforms into domains appropriate for musical signal processing, coding or compression G10H 2250/215)
G10H 2250/151	. .	Fuzzy logic
G10H 2250/155	. .	Graham function, i.e. mathematical description of the fluid dynamics of air flowing through a gap, where there is a given pressure differential on either side of the gap, e.g. to model air velocity in wind instruments for physical modeling sound synthesis
G10H 2250/161	. .	Logarithmic functions, scaling or conversion, e.g. to reflect human auditory perception of loudness or frequency
G10H 2250/165	. .	Polynomials, i.e. musical processing based on the use of polynomials, e.g. distortion function for tube amplifier emulation, filter coefficient calculation, polynomial approximations of waveforms, physical modeling equation solutions
G10H 2250/171	. . .	Hermite polynomials
G10H 2250/175	. . .	Jacobi polynomials of several variables, e.g. Heckman-Opdam polynomials, or of one variable only, e.g. hypergeometric polynomials

G10H 2250/181	. . . .	Gegenbauer or ultraspherical polynomials, e.g. for harmonic analysis
G10H 2250/185	. . . . .	Legendre polynomials, e.g. for the modeling of air flow dynamics in wind instruments
G10H 2250/191	. . . . .	Chebyshev polynomials e.g. to provide filter coefficients for sharp rolloff filters (Chebyshev filters G10H 2250/091; Chebyshev windows G10H 2250/271)
G10H 2250/195	. . .	Lagrange polynomials, e.g. for polynomial interpolation or cryptography
G10H 2250/201	. . .	Parabolic or second order polynomials, occuring e.g. in vacuum tube distortion modeling or for modeling the gate voltage to drain current relationship of a JFET
G10H 2250/205	. . .	Third order polynomials, occuring e.g. in vacuum tube distortion modeling
G10H 2250/211	. .	Random number generators, pseudorandom generators, classes of functions therefor (musical processes using white noise or nonwhite noise generators G10H 2250/295; noise formant generator G10H 2250/495; magnetic or electromagnetic noise shielding G10H 2220/565)
G10H 2250/215	. .	Transforms, i.e. mathematical transforms into domains appropriate for musical signal processing, coding or compression
G10H 2250/221	. . .	Cosine transform; DCT [discrete cosine transform], e.g for use in lossy audio compression such as MP3 (MP3 format G10H 2240/061)
G10H 2250/225	. . . .	MDCT [Modified discrete cosine transform], i.e. based on a DCT of overlapping data (adaptive MDCT compression, e.g. ATRAC [adaptive transform acoustic coding] G10H 2250/575)
G10H 2250/231	. . .	Fermat transform
G10H 2250/235	. . .	Fourier transform; Discrete Fourier Transform [DFT]; Fast Fourier Transform [FFT]
G10H 2250/241	. . .	Hadamard transform, Walsh-Hadamard transform, Hadamard-Rademacher-Walsh transform, Walsh transform, or Walsh-Fourier transform
G10H 2250/245	. . .	Hartley transform,; Discrete Hartley transform [DHT]; Fast Hartley transform [FHT]
G10H 2250/251	. . .	Wavelet transform, i.e. transform with both frequency and temporal resolution, e.g. for compression of percussion sounds; Discrete Wavelet Transform [DWT].
G10H 2250/255	. . .	Z-transform, e.g. for dealing with sampled signals, delays or digital filters
G10H 2250/261	. .	Window, i.e. apodization function or tapering function amounting to the selection and appropriate weighting of a group of samples in a digital signal within some chosen time interval, outside of which it is zero valued
G10H 2250/265	. . .	Blackman Harris window
G10H 2250/271	. . .	Chebyshev window (Chebyshev polynomials G10H 2250/191; Chebyshev filters G10H 2250/091)
G10H 2250/275	. . .	Gaussian window
G10H 2250/281	. . .	Hamming window
G10H 2250/285	. . .	Hann or Hanning window
G10H 2250/291	. . .	Kaiser windows; Kaiser-Bessel Derived [KBD] windows, e.g for MDCT
G10H 2250/295	.	Noise generation, its use, control or rejection for music processing (white noise or pseudorandom generators G10H 2250/211; use of noise in formant synthesis G10H 2250/495; automatic gain control H03G 3/32; speech or noise detection G10L 1/02)
G10H 2250/301	. .	Pink 1/? noise or flicker noise
G10H 2250/305	. .	Noise or artifact control in electrophonic musical instruments (transducer shielding

G10H 2220/565; filter notch G10H 2250/125; waveform aliasing G10H 2250/545)

G10H 2250/311	.	Neural networks for electrophonic musical instruments or musical processing, e.g. for musical recognition or control, automatic composition or improvisation (musical analysis G10H 2210/031; neural networks G06N 3/02)
G10H 2250/315	.	Sound category-dependent sound synthesis processes [Gensound] for musical use (details of musical waveform synthesis G10H 2250/541; general musical sound synthesis principles G10H 2250/471); Sound category-specific synthesis-controlling parameters or control means therefor
G10H 2250/321	. .	Gensound animals, i.e. generating animal voices or sounds
G10H 2250/325	. . .	Birds
G10H 2250/331	. . . .	Ducks
G10H 2250/335	. . . .	Sea birds, e.g. seagulls
G10H 2250/341	. . .	Cats
G10H 2250/345	. . .	Cattle, e.g. cows
G10H 2250/351	. . .	Dogs
G10H 2250/355	. . .	Elk or other animals in the Cervidae family, e.g. moose, wapiti, reindeer
G10H 2250/361	. . .	Insects, e.g. cricket
G10H 2250/365	. .	Gensound applause, e.g. handclapping; Cheering; Booing (crowd sounds G10H 2250/401)
G10H 2250/371	. .	Gensound equipment, i.e. synthesizing sounds produced by man-made devices, e.g. machines
G10H 2250/375	. . .	Harbour, i.e. sounds which are part of a harbour soundscape, e.g. ships, fog horn, buoy, bells, cranes
G10H 2250/381	. . .	Road, i.e. sounds which are part of a road, street or urban traffic soundscape, e.g. automobiles, bikes, trucks, traffic, vehicle horns, collisions
G10H 2250/385	. . .	Train, i.e. sounds which are part of a railroad soundscape, e.g. steam engines, diesel, electric, train whistles, rail wheels, railway crossing
G10H 2250/391	. .	Gensound footsteps, i.e. footsteps, kicks or tap-dancing sounds
G10H 2250/395	. .	Gensound nature
G10H 2250/401	. . .	Crowds, e.g. restaurant, waiting hall, demonstration, subway corridor at rush hour (applause, cheering, booing G10H 2250/365)
G10H 2250/405	. . .	Fire, e.g. cracks and pops of burning wood
G10H 2250/411	. . .	Water, e.g. seashore, waves, brook, waterfall, dripping faucet
G10H 2250/415	. . .	Weather
G10H 2250/421	. . . .	Rain
G10H 2250/425	. . . .	Thunder
G10H 2250/431	. . . .	Natural aerodynamic noises e.g. wind gust sounds, rustling leaves, beating sails (gensound wind instruments G10H 2250/461; spint wind instruments G10H 2230/155)
G10H 2250/435	. .	Gensound percussion, i.e. generating or synthesising the sound of a percussion instrument; Control of specific aspects of percussion sounds, e.g. harmonics, under the influence of hitting force, hitting position, settings or striking instruments such as mallet, drumstick, brush, hand (spint percussion G10H 2230/231)
G10H 2250/441	. .	Gensound string, i.e. generating the sound of a string instrument, controlling specific features of said sound (spint piano G10H 2230/065; spint stringed instruments G10H 2230/075)

G10H 2250/445	. . .	Bowed string instrument sound generation, controlling specific features of said sound, e.g. use of fret or bow control parameters for violin effects synthesis (bow interfaces per se G10H 2220/365; modulation effects G10H 2210/195; spint viola G10H 2230/081; spint cello G10H 2230/085)
G10H 2250/451	. . .	Plucked or struck string instrument sound synthesis, controlling specific features of said sound (spint harpsichord G10H 2230/071; spint stringed instruments G10H 2230/075)
G10H 2250/455	. .	Gensound singing voices, i.e. generation of human voices for musical applications, vocal singing sounds or intelligible words at a desired pitch or with desired vocal effects, e.g. by phoneme synthesis (formant synthesis G10H 2250/481; parcor synthesis G10H 2250/505; modulation effects G10H 2210/195; ensemble effects G10H 2210/245; speech synthesis in general G10L13)
G10H 2250/461	. .	Gensound wind instruments, i.e. generating or synthesising the sound of a wind instrument, controlling specific features of said sound (spint wind instruments G10H 2230/155; mouth or breath sensors G10H 2220/361; natural aerodynamic noise synthesis, e.g. wind G10H 2250/431)
G10H 2250/465	. . .	Reed instrument sound synthesis, controlling specific features of said sound (spint reed G10H 2230/205)
G10H 2250/471	.	General musical sound synthesis principles, i.e. sound category-independent synthesis methods (details of musical waveform synthesis G10H 2250/541; special instrument [spint] G10H 2230/045; sound category-specific synthesis G10H 2250/315)
G10H 2250/475	. .	FM synthesis, i.e. altering the timbre of simple waveforms by frequency modulating them with frequencies also in the audio range, resulting in different-sounding tones exhibiting more complex waveforms
G10H 2250/481	. .	Formant synthesis, i.e. simulating the human speech production mechanism by exciting formant resonators e.g. mimicking vocal tract filtering as in LPC synthesis vocoders, wherein musical instruments may be used as excitation signal to the time-varying filter estimated from a singer's speech (gensound singing voices G10H 2250/455; parcor synthesis G10H 2250/505; effect Helmholtz G10H 2210/275)
G10H 2250/485	. . .	Formant correction therefor
G10H 2250/491	. . .	Formant interpolation therefor
G10H 2250/495	. . .	Use of noise in formant synthesis
G10H 2250/501	. . .	Formant frequency shifting, sliding formants (wah-wah spectral modulation G10H 2210/231)
G10H 2250/505	. .	Parcor synthesis, i.e. music synthesis using partial autocorrelation techniques, e.g. in which the impulse response of the digital filter in a parcor speech synthesizer is used as a musical signal (gensound singing voices G10H 2250/455; formant synthesis G10H 2250/481)
G10H 2250/511	. .	Physical modelling or real-time simulation of the acoustomechanical behaviour of acoustic musical instruments using e.g. waveguides or looped delay lines (models in general G05B 17/00)
G10H 2250/515	. . .	Excitation circuits or excitation algorithms therefor
G10H 2250/521	. . .	Closed loop models therefor, e.g. with filter and delay line
G10H 2250/525	. . .	Pluridimensional array-based models therefor
G10H 2250/531	. . .	Room models, i.e. acoustic physical modelling of a room, e.g. concert hall (reverberation or echo G10H 2210/281; soundscape or sound field simulation G10H 2210/301)
G10H 2250/535	. . .	Waveguide or transmission line-based models
G10H 2250/541	.	Details of musical waveform synthesis, i.e. audio waveshape processing from

individual wavetable samples, independently of their origin or of the sound they represent (sound category-dependent sound synthesis G10H 2250/315; special instruments [spint] G10H 2230/045; general musical sound synthesis principles G10H 2250/471)

G10H 2250/545	. .	Aliasing, i.e. preventing, eliminating or deliberately using aliasing noise, distortions or artifacts in sampled or synthesised waveforms, e.g. by band limiting, oversampling or undersampling, respectively.
G10H 2250/551	. .	Waveform approximation, e.g. piecewise approximation of sinusoidal or complex waveforms
G10H 2250/555	. . .	Piecewise linear waveform approximation
G10H 2250/561	. . .	Parabolic waveform approximation, e.g. using second order polynomials or parabolic responses (parabolic or second order polynomials G10H 2250/201)
G10H 2250/565	. . .	Polynomial waveform approximation, i.e. using polynomials of third order or higher (third order polynomials G10H 2250/205)
G10H 2250/571	. .	Waveform compression, adapted for music synthesisers, sound banks or wavetables (audio compression G10L 19/00)
G10H 2250/575	. . .	Adaptive MDCT-based compression, e.g. using a hybrid subband-MDCT, as in ATRAC (non adaptive MDCT G10H 2250/225)
G10H 2250/581	. . .	Codebook-based waveform compression
G10H 2250/585	. . . .	CELP [code excited linear prediction]
G10H 2250/591	. . .	DPCM [delta pulse code modulation]
G10H 2250/595	. . . .	ADPCM [adaptive differential pulse code modulation]
G10H 2250/601	. . .	Compressed representations of spectral envelopes, e.g. LPC [linear predictive coding], LAR [log area ratios], LSP [line spectral pairs], reflection coefficients
G10H 2250/605	. . .	Dynamic range companding algorithms, e.g. "mu"-law, primarily used in the digital telephone systems of North America and Japan, or A-law as used in European digital telephone systems
G10H 2250/611	. .	Waveform decimation, i.e. integer division of the sampling rate for reducing the number of samples in a discrete-time signal, e.g. by low-pass anti-alias filtering followed by the actual downsampling
G10H 2250/615	. .	Waveform editing, i.e. setting or modifying parameters for waveform synthesis. (graphical sound editing G10H 2220/116)
G10H 2250/621	. .	Waveform interpolation
G10H 2250/625	. . .	Interwave interpolation, i.e. interpolating between two different waveforms e.g. timbre or pitch or giving one waveform the shape of another while preserving its frequency or vice-versa
G10H 2250/631	. .	Waveform resampling, i.e. sample rate conversion or sample depth conversion (waveform decimation G10H 2250/611)
G10H 2250/635	. .	Waveform resolution or sound quality selection, e.g. selection of high or low sampling rates, lossless, lossy or lossier compression algorithms
G10H 2250/641	. .	Waveform sampler, i.e. music samplers; Sampled music loop processing, wherein a loop is a sample of a performance that has been edited to repeat seamlessly without clicks or artifacts
G10H 2250/645	. .	Waveform scaling, i.e. amplitude value normalisation